4.2.8 Small Scale Wind Energy Systems of less than 100 feet in height.

1. Purpose
The purpose of this bylaw is to provide for the construction and operation of wind energy facilities and to provide standards for the placement, design, construction, monitoring, modification and removal of wind facilities that address public safety, minimize impacts on scenic, natural and historic resources of the town and provide adequate financial assurance for decommissioning.

2. The provisions set forth in this section shall take precedence over all other sections when considering applications related to the construction, operation, and/or repair of wind energy facilities.

3. Applicability
This section applies to all on-site small wind energy facilities, proposed to be constructed after the effective date of this section. This section also includes building integrated wind systems, and physical modifications to existing wind facilities that materially alter the type, configuration, location or size of such facilities or other equipment.

4. Height:
The height of a wind turbine measured from natural grade to the tip of the rotor blade at its highest point, or blade-tip height. This measure is also commonly referred to as the maximum tip height (MTH).

5. Special Permit Granting Authority:
A Special Permit shall be required for the installation of a small wind energy system.
The special permit granting authority shall be the planning board, as designated by zoning by-law for the issuance of special permits, or by this section for the issuance of special permits to construct and operate wind facilities.

6. Substantial Evidence:
Such evidence as a reasonable mind might accept as adequate to support a conclusion.

7. Building Integrated Wind Energy Facility:
A wind energy facility shall be considered to be building integrated if it is designed to be permanently mounted on a building or other inhabitable structure. This definition applies to wind turbines of any capacity that are designed to be operated in direct contact with a building. This definition also covers, for the purposes of this zoning provision, other wind energy facilities primarily used for land-based applications which may be permanently mounted and operated on a building.

8. Setbacks
A wind turbine may not be sited within:
(a) a distance equal to one and one-half (1.5) times the maximum tip height (MTH) of the wind turbine from buildings, critical infrastructure including Critical Electric Infrastructure and above-ground natural gas distribution infrastructure—or private or public ways that are not part of the wind energy facility;
(b) a distance equal to one and one-half (1.5) times the maximum tip height (MTH) of the turbine from the nearest property line, and private or public way.

9. Set Back Waiver
The special permit granting authority may reduce the minimum setback distance as appropriate based on site-specific considerations, or written consent of the affected abutter(s), if the project satisfies all other criteria for the granting of a special permit under the provisions of this section.

10. General Required Documents
The special permit application submitted to the Planning Board must, at a minimum, include the following:
(a) A plot plan of the proposed wind facility site, with contour intervals of no more than 10 feet, showing:
i. Property lines and physical dimensions of the subject property within 500 feet of the wind turbine from the proposed tower location.
ii. Location, dimensions, and types of existing major structures on the property
iii. Location of the proposed wind system tower, foundations, guy anchors and associated equipment.
iv. The right-of-way of any public road that is contiguous with the property;
v. Location of all existing above ground or overhead gas or electric infrastructure, including Critical Electric Infrastructure, and utility rights of way (ROW) and easements, whether fully cleared of vegetation or only partially cleared, within 500 feet of the site parcel;
(b) Wind energy facility technical specifications, including manufacturer and model, rotor diameter, tower height, type (freestanding or guyed), foundation type/dimensions
(c) Tower foundation blueprints or drawings signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.
(d) Tower blueprints or drawings signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts.
(e) Electrical schematic
(f) Name, address, phone number and signature of the applicant, as well as all co-applicants or property owners, if any.
(g) The name, contact information and signature of any agents representing the applicant.
(h) A plan for maintenance of the small wind energy facility.
Additional Required Supporting Documentation for Building Integrated Wind Energy Facilities
(a) Analysis and design documents, completed by a structural engineer registered to practice in the Commonwealth of Massachusetts, demonstrating that the proposed building is structurally sufficient to support the permanent installation of the proposed building integrated wind energy facility. At a minimum, the analysis should address vibration, wind load, and ice load.
(b) Elevation drawings of building with building integrated wind energy facility installed, viewed from north, south, east, and west.
(c) Building schematic detailing point(s) of connection and associated supports for the building integrated wind energy facility.
(d) Schematic of attachment method for connecting the building integrated wind energy facility to the building.
(e) Specification sheets for wind turbine and all related components (inverters, controllers, disconnects, etc.)
(f) One or three line electrical diagram detailing wind turbine, associated components, and electrical interconnection methods, with all NEC compliant disconnects and overcurrent devices.

11. A permit shall be granted unless the permit granting authority finds in writing that there is substantial evidence that:
(a) the specific site is not an appropriate location for such use;
(b) there is expected to be any serious hazard to pedestrians or vehicles from the use;
(c) a nuisance is expected to be created by the use; and
(d) adequate and appropriate facilities will be not provided for the proper operation and maintenance of the use.

12. Compliance with Laws, Ordinances and Regulations
The construction and operation of all such proposed wind energy facilities shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, environmental, electrical, communications and aviation requirements.

13. Proof of Liability Insurance
The applicant shall be required to provide evidence of liability insurance in an amount, and for a duration, sufficient to cover loss or damage to persons and property occasioned by the failure of the facility.
14. Design Standard
(a) Appearance, Color and Finish
FAA Safety consideration on color and appearance should be respected. Where applicant is seeking a non-standard color in an area not regulated by the FAA, the zoning board has authority to regulate color of turbine.
(b) Lighting
Wind turbines shall be lighted only if required by the Federal Aviation Administration. Lighting of other parts of the wind energy facility, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties.
(c) Signage
Signs on the wind energy facility shall comply with the requirements of the town's sign regulations, and shall be limited to those necessary to identify the owner, provide a 24 hour emergency contact phone number, and warn of any danger.

15. Advertising
Wind turbines shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the wind energy facility.

16. Appurtenant Structures
All appurtenant structures to wind energy facilities shall be subject to applicable regulations concerning the bulk and height of structures, lot area, setbacks, open space, parking and building coverage requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other and shall be contained within the turbine tower whenever technically and economically feasible. Whenever reasonable, structures should be shaded from view by vegetation and/or located in an underground vault and joined or clustered to avoid adverse visual impacts.

17. Safety and Environmental Standards
(a) Emergency Services
The applicant shall provide a copy of the project summary, electrical schematic, and site plan to the local emergency services entity, as designated by the permit granting authority as well as the local electrical utility company. Upon request the applicant shall cooperate with local emergency services in developing an emergency response plan.
All means of disconnecting the wind energy facility shall be clearly marked.
The applicant or facility owner shall maintain a phone number and identify a responsible person for the public to contact with inquiries and complaints throughout the life of the project.
(b) Unauthorized Access
Wind turbines or other structures part of a wind energy facility shall be designed to

prevent unauthorized access. For instance, the tower shall be designed and installed so as to not provide step bolts or other climbing means readily accessible to the public for a minimum height of 8 feet above the ground. Electrical equipment shall be locked where possible.

18. Shadow/Flicker
Wind energy facilities shall be sited in a manner that minimizes shadowing or flicker impacts. The applicant has the burden of proving that this effect does not have significant adverse impact on neighboring or adjacent uses.

19. Sound
The wind facility and associated equipment shall conform with the provisions of the Department of Environmental Protection's Division of Air Quality Noise Regulations (310 CMR 7.10), unless the Department and the Permit Granting Authority agree that those provisions shall not be applicable. A source of sound will be considered to be violating these regulations if the source:
(a) Increases the broadband sound level by more than 10 dB(A) above ambient, or
(b) Produces a "pure tone" condition – when an octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.
These criteria are measured both at the property line and at the nearest inhabited structure. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment hours. The ambient may also be established by other means with consent from DEP. An analysis prepared by a qualified engineer shall be presented to demonstrate compliance with these noise standards, if required by the permit granting authority.
The permit granting authority, in consultation with the Department, shall determine whether such violations shall be measured at the property line or at the nearest inhabited residence.

20. Land Clearing, Soil Erosion and Habitat Impacts
Clearing of natural vegetation shall be limited to that which is necessary for the construction, operation and maintenance of the wind facility and is otherwise prescribed by applicable laws, regulations, and ordinances, and subject to existing easements, restrictions and conditions of record.

21. Monitoring and Maintenance
(a) Facility Conditions
The applicant shall maintain the wind energy facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, emergency braking (stopping) and integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief and Emergency Medical Services. The project owner shall be responsible for the cost of maintaining the wind energy facility and any access road(s), unless accepted as a public way, and the cost of repairing any damage occurring as a result of operation and construction.
(b) Modifications
All material modifications to a wind energy facility made after issuance of the permit shall require approval by the permit granting authority as provided in this section.

22. Abandonment or Decommissioning

Removal Requirements
Any wind energy facility which has reached the end of its useful life or has been abandoned shall be removed. When the wind energy facility is scheduled to be decommissioned, the applicant shall notify the town by certified mail of the proposed date of discontinued operations and plans for removal. The owner/operator shall physically remove the wind facility no more than 150 days after the date of discontinued operations. At the time of removal, the wind facility site shall be restored to the state it was in before the facility was constructed or any other legally authorized use. More specifically, decommissioning shall consist of:
(a) Physical removal of all wind turbines, structures, equipment, security barriers and transmission lines from the site.
(b) Disposal of all solid and hazardous waste in accordance with local and state waste disposal regulations.
(c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The permit granting authority may allow the owner to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

23. Abandonment
Absent notice of a proposed date of decommissioning, the facility shall be considered abandoned when the facility fails to operate for more than one year without the written consent of the permit granting authority. The permit granting authority shall determine in its decision what proportion of the facility is inoperable for the facility to be considered abandoned. If the applicant fails to remove the wind energy facility in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the town shall have the authority to enter the property and physically remove the facility with all expenses incurred the responsibility of the owner and/or operator.

24. Expiration
A permit issued pursuant to this ordinance shall expire if:
(a) The wind energy facility is not installed and functioning within 48-months from the date the permit is issued; or,
(b) The wind energy facility is abandoned.

25. Violations
It is unlawful for any person to construct, install, or operate a wind energy system that is not in compliance with this ordinance or with any condition contained in a permit issued pursuant to this ordinance. Wind energy systems installed prior to the adoption of this ordinance are exempt.